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Report of the regional implementation meeting of the Economic and Social Commission for Western Asia

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I. Introduction

1. The sixteenth session of the United Nations Commission on Sustainable Development will be convened from 5 to 16 May 2008. The Commission will review the progress achieved by the countries implementing the obligations stated in the Johannesburg Plan of Implementation and in other international conventions addressing five basic clusters, namely, agriculture, rural development, land, drought and desertification. The present report reviews the progress achieved in the implementation of obligations and objectives at the regional level relevant to those five clusters and will be submitted to the Commission at the session. In addition, the report assesses the challenges and constraints facing the Arab region in the implementation of those objectives and sheds light on possible actions in priority areas for the next stage.

2. The report was prepared within the framework of Arab coordination and cooperation to achieve sustainable development and to prepare for meetings of the Commission on Sustainable Development, and reflects a sequence of joint events carried out between the Economic and Social Commission for Western Asia (ESCWA), the League of Arab States (LAS), the Regional Office for West Asia of the United Nations Environment Programme, Arab, regional and international organizations involved in the relevant fields, civil society organizations, experts from Arab countries and member organizations of the Joint Committee on Environment and Development in the Arab Region. Preparation of the report included the following procedures:

(a) Arab and regional organizations involved prepared five regional reports, one for each of the five clusters submitted to the Commission at its sixteenth session;[1]

(b) The Regional Conference on Land Degradation Issues in the Arab Region was convened in Cairo from 30 October to 1 November 2007, where the regional reports on the five main issues were discussed among experts in different fields from Arab countries and representatives from the ministries of environment, Arab organizations dealing with the topics in question and the secretariat of the United Nations Convention to Combat Desertification;

(c) ESCWA prepared the final draft of the regional implementation report for the Arab region, which was submitted and discussed during the ninth session of the Joint Committee, held in Cairo, from 4 to 6 November 2007. The draft report included an introduction and one chapter on each of the five aforementioned main clusters to be discussed by the Commission at its sixteenth session.

3. The Arab region extends over 14.01 million km^2, representing 10.2 per cent of the total area of the world. Hyperarid and arid areas cover 90 per cent of the entire Arab region, including 43 per cent of such extended deserts as the Sahara Desert and the Great Arabian Desert on the Arabian Peninsula. The countries of the region are divided into four subregions: the Arabian Peninsula and the eastern, middle and western subregions.

[1] The Arab Centre for the Studies of Arid Zones and Dry Lands (ACSAD) prepared two reports on the topics of land and desertification; the Arab Organization for Agricultural Development (AOAD) prepared two reports on agriculture and rural development; and the International Centre for Agricultural Research in the Dry Areas (ICARDA) prepared a report on drought.

4. Soil, plant cover, topography and geo-morphology vary greatly from one Arab area and subregion to the next. The region comprises deserts, plateaus, inner plains, elevated areas and coastal zones. Most of those areas suffer from the scarcity of water resources, as the total water resources available in the region are estimated at 2,522 billion m^3 — including 2,282 billion m^3 of rainfall, 205 billion m^3 of surface water and 35 billion m^3 of groundwater. Unconventional water resources are estimated at 11.9 billion m^3. Arable land comprises 197 million hectares (ha), representing 14 per cent of the total area of the region, while currently cultivated land is estimated at 79.5 million ha. Rangeland, which in the Arab region is characterized by sparse plant cover and few palatable plants, is estimated at 400 million ha. The total forest area is currently estimated at 61.3 million ha, representing around 4 per cent of the total area of the Arab region, with most forest land located in Algeria, Morocco and the Sudan.

5. The total population of the region reached 309 million by 2005, with an average yearly growth of 2.7 per cent over the last two decades, compared to a global average increase of 1.5 per cent per year. The ratios of rural population vary considerably throughout the countries of the region and range from 4 per cent in Kuwait to more than 75.3 per cent in Yemen, with an overall average of 46.3 per cent for the entire region. Most of the population is living below the poverty line of one dollar per day per person. The poverty rate varies greatly among the countries of the region: it is almost nil in the Arab Gulf States, while in the least developed countries, the rate has increased from 37.1 per cent (1990-1995) to 46.8 per cent (2000-2004) and has reached more than 70 per cent in such countries as Djibouti and Somalia.

II. Agriculture

A. Current status

6. Agricultural development depends on the use of such natural resources as land and water, animal resources and fisheries, in addition to agricultural labour forces, the latter being one of the most important assets for agricultural development.

7. Only 35 per cent of the total Arab region, which extends over an area of 14.01 million km^2, is used land. From 1996 to 2004, arable lands increased at a yearly rate of 2 per cent. The growing problems of desertification and land degradation in the region, the continued decline of plant cover and the degradation of rangelands have adverse impacts on areas available for agricultural development.

8. Scarce water resources are among the main factors that limit agricultural development in the Arab region. In addition to the scarcity of water resources, the disparity of their distribution and the limitation of their use in certain regions, the demand for agricultural water is continuously increasing. This development imposes considerable pressure on regional water resources available for the agricultural sector.

9. Animal resources are a major asset to agricultural development, in particular for the rural society. Statistics show that animal resources increased from about 249.3 million heads in 1990 to about 373.3 million heads in 2004. However, animal resources are subject to a number of factors which may curtail development and

which call for collaboration among Arab countries, namely, the availability of feed, diseases and enhanced breeding programmes.

10. The great potential of fisheries in the region has not yet been seriously exploited. Investments in this sector are far below the desired level and do not reflect the available potentials and resources. Resources applied and efforts made to develop this component of agricultural development vary greatly throughout the region.

11. By 2005, the agricultural labour forces consisted of about 35 million labourers, representing 32 per cent of the total labour forces in the Arab countries. In 2004, the share of cultivated land per agricultural labourer averaged 1.98 ha, signifying a slight decline from 2.06 ha in 1990.

12. The total deficit having occurred through spending on the main agricultural commodities in the region is estimated at $18.6 billion. Cereals and flower alone contribute 48.9 per cent, followed by milk and dairy products (14.4 per cent), plant oils (12.5 per cent), pure sugar (6.5 per cent), red meat (6.7 per cent), poultry (6.1 per cent), fruits (2.3 per cent), pulses (2.2 per cent) and potatoes (0.4 per cent). Vegetables and fisheries are the only two commodities that show a positive trade balance and contribute no burden to the budget.

B. Progress achieved

13. Most countries in the region are predominantly agrarian. The foregoing review of the basic features of the available resources of land, water and natural plant cover depicts the great disparity in the distribution of natural resources in the Arab region.

1. Agricultural policies

14. Since the beginning of the 1990s, most Arab Governments have adopted such agricultural reforms and market-based policies as privatization, the curtailing of subsidies, institutional development, reformed prices and the enhancement of private investments in agricultural production and services. However, public spending is still relatively high and constitutes a heavy burden on State budgets. The reformed agricultural policies encourage investment in agriculture, which consequently increased from $91.7 billion in the 1990s to $176.5 billion in 2004, whereas Governments focus more on support services, including research and extension, and deal with impacts and pressures brought about by foreign policies.

2. Application of appropriate technologies

15. The application of appropriate and modern techniques has led to increased productivity, especially in the irrigation of cereals, vegetables, fruits and fodder. Among the technologies fostering the rational use of water are deficit irrigation, bed planting and improved furrow irrigation, which were introduced as alternatives to less efficient irrigation techniques.

16. In rain-fed areas, the appropriate use of fertilizers, integrated pest management, the improvement of water productivity and the efficient use of nutrients have been practised.

17. Supplementary irrigation techniques, conservation tillage, also known as no-till farming, and water harvesting systems have been utilized.

18. Drought-tolerant varieties of cereals, legumes and feed have been selected and used by farmers and herders.

19. In agro-pastoral systems, adapted management practices based on the local knowledge of livestock and pastures have been tested and implemented.

3. Impacts of applied measures

20. Agricultural development measures in the region resulted in enhancing the productivity of cereals from an annual average of 40.1 million tons (1990-1992) to about 52.5 million tons (2002-2004); for legumes, productivity increased by 21 per cent over the same period, while for vegetables and fruits, it increased by 58.7 per cent and 45.2 per cent, respectively.

21. The production of sugar increased by 43.8 per cent, oils by 71.9 per cent, meat by 73 per cent, fish by 81 per cent and dairy products by 66.7 per cent. It should be borne in mind, however, that the impact of this total production increase is significantly less if the annual average population growth of 2.3 per cent is taken into consideration.

22. Animal units increased from 249.3 million heads in 1990 to an estimated 373.3 million heads in 2004, meaning an average annual increase of 2.9 per cent.

4. Agricultural commodities trade

23. For the period 1990-2004, average annual agricultural exports rose from $3.04 billion (1990-1992) to $4.26 billion (2002-2004). At the same time, total agricultural imports grew from an annual average of $13.25 billion (1990-1992) to $19.36 billion (2002-2004), resulting in a clear increase in the agricultural trade deficit.

5. Fisheries

24. Fisheries represent a significant food source in Arab countries, especially along the extended coastal lines (22,400 km), lengthy rivers (16,600 km) and natural lakes, and have the potential for significant job opportunities and export revenues if related processing and industrial activities were developed. Only three countries — Egypt, Mauritania and Morocco — account for 67.8 per cent of the total fish production in the region. With proper investment and the provision of required facilities, fish production could be significantly enhanced and could contribute positively to agricultural economics in the region.

6. Agricultural education

25. The increase of agricultural institutes at the higher education level and of technicians at the mid-level manifests the growing interest in capacity-building in the field of agricultural education. Large numbers of graduates are currently available. Yet, the quality of their education seems to be wanting. Both national and regional organizations offer diversified and numerous training courses and programmes. Concerted efforts are required to reorient and upgrade the skills required of agricultural graduates in the region to meet the needs of the market.

7. Food safety and monitoring

26. Awareness of the significance of food safety has been greatly enhanced in the last two decades and its impacts on health, marketing and foreign trade are now recognized at different levels. Relevant conferences and workshops were convened throughout the region, and various institutions, non-governmental organizations and civil society organizations are investigating sources and factors of food pollution. Even though the concepts of organic farming and biofarming are supported by several national institutions, the adoption of those concepts at the field level is still limited. Certified areas for organic farming are estimated at less than 50,000 ha in the entire region, which is rather limited compared to the total cultivated area. No reliable data are yet available as to the areas devoted to biofarming in Arab countries.

C. Challenges and constraints

27. Efforts and activities carried out over the last two decades to realize sustainable development in the region have resulted in significant progress. However, key challenges and constraints at different levels still impede full achievement and limit the progress achieved. The following sections depict such challenges and constraints with emphasis on cross-cutting issues.

1. Population growth rate

28. Over the last five decades, the population in the Arab region nearly increased fourfold, from about 77 million in the 1950s to an estimated 309 million in 2005, with an overall average growth of 2.3 per cent, which is among the highest in the world. The ever-continuing population increase significantly undermines all endeavours to enhance economic and social achievements in the region and presents a heavy burden as regards food security, rural development, and required services and infrastructure.

2. Exchange of knowledge and expertise

29. Joint efforts with active Arab and regional organizations to establish and define varied networks and databases covering the main priority issues in the region are already being made. Yet, in order to fully achieve all the objectives of those activities, even more efforts are needed so as to raise the number of Arab countries taking part in such endeavours. Several Arab countries have acquired distinguished expertise that could be exchanged with other countries of the region, namely, in the fields of arid soil reclamation, organic farming, combating desertification, information technology, appropriate management practices for protected areas and technology transfer. Unfortunately, no exchange of expertise and knowledge is presently taking place among Arab countries.

3. Institutional coordination

30. A review of national reports reveals a surprising lack of even minimal coordination and a significant degree of duplication among the institutions concerned. Such conditions hamper proper planning for capacity-building and lead to the wasting of efforts, funds and manpower. The same applies to the implementation of such major environmental conventions as the United Nations

Convention to Combat Desertification, the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change, which need to be synergized without delay.

4. Effective legislations

31. The number and nature of laws, legislation and regulations to safeguard the various aspects of sustainable development vary greatly within the Arab region. Here also, an appropriate exchange of expertise could be helpful for Arab countries. However, what many countries unfortunately seem to have in common is the lack of appropriate and efficient mechanisms to enforce such important legislation.

5. Absence of peace and security

32. Several examples could be cited where political instability, conflicts and wars were the most significant constraints to sustainable development. The past decade witnessed a number of wars and political conflicts which hampered the development process in the Arab region. This resulted in the pollution of land and water, as is the case in Palestine and Iraq, and limited the use of natural resources because of landmines, as is the case in Lebanon. This eventually resulted in the disruption of investment and production plans, suspension of efforts, forgone economic gains, loss of investment opportunities and loss of time and funds.

6. Upgrading of services

33. The upgrading and efficiency increase of agricultural, health and educational services are among the main pillars to achieve sustainable development. Agricultural support services, including extension, insurance for varied objectives, and small and appropriate credits, are not offered adequately in certain countries or rural areas and no efforts are undertaken to properly support and upgrade them. Similar trends are observed at different levels for health and education services.

7. Awareness campaigns

34. More emphasis needs to be placed on ongoing activities at the national level to raise awareness of environmental and sustainable development constraints, especially among stakeholders in rural areas. Awareness programmes need to be designed and prepared in layman language using all possible media facilities to ensure the progress of sustainable development.

8. Adoption of a participatory approach

35. In most countries of the region, relevant stakeholders must be encouraged to increasingly adopt participatory practices. Their participation in planning, implementing and evaluating the impacts of the varied activities is fundamental to secure success and to properly address the real demands of the stakeholders concerned.

36. In addition to the foregoing, it is important to stress the significance of safe and clean food. Consumers are exposed to different sources of pollution that pose threats to food safety, including the irrational use of pesticides, herbicides, chemical fertilizers and food additives. Lately, international trade agreements have facilitated the global exchange of commodities, the proper monitoring of product quality and

the detection of trade frauds. Arab countries are devoting greater attention to the monitoring of food safety, the protection of consumers and the establishment of related institutions and authorities. However, to fully safeguard clean and safe food, a number of challenges and constraints still need to be dealt with, inter alia, the lack of sufficient facilities, standard measures and indicators, inferior research and development capacities, responsibilities spread out among several authorities concerned, the lack of referenced and unified measures for monitoring food qualities, the absence of coordination among different institutions concerned and limited funding.

D. Areas for action

37. An Arab agricultural policy taking into account national and regional objectives would represent a basic pillar for sustainable development in the whole region. It is recommended that such a policy address the enhancement of multilateral and foreign trade, agricultural research, unified quarantine regulations, coordinated agricultural legislation pertinent to environmental and food safety, unified standards and qualities for agricultural commodities, and the protection of intellectual property rights.

38. Priority needs to be given to the application of biotechnology and biodiversity techniques and the use of appropriate halophyte plants for agricultural research activities. Gene banks should be established to conserve, propagate and spread the use of indigenous plant species adapted to drought, heat stress, salinity and other adverse environmental conditions.

39. Promising potential and presently underdeveloped resources available in the region should be promoted. This includes fisheries, animal wealth and market-driven commodities with high relative economic advantages (off-season commodities in foreign markets).

40. Agricultural marketing facilities enhance the efficiency of organization, storage and post-harvesting processing, which are just as significant as production sustainability factors. Marketing losses, especially those incurred during post-harvest processing, are relatively high in the Arab region and lead to an estimated 25 per cent loss for vegetables and fruits and 15 per cent for cereals. Such losses have significant adverse impacts on farmers' economic returns and decision-making.

41. Capacity-building activities should be expanded at all levels concerning productivity, institutions active in the agriculture sector should be promoted, financial facilities to support projects to curtail poverty should be enhanced and the participation of women in economic activities should be strengthened.

42. The adopted Arab strategy for sustainable agricultural development should be implemented with emphasis on:

(a) Planning of needs and implementation of joint Arab projects;

(b) Joint financing and investment in the field of technology development;

(c) Planning and implementation of programmes to develop and improve agricultural commodities;

(d) Development of agro-industry;

(e) Support for agricultural trade among Arab countries.

43. Laboratories available and active in the region need to be developed and upgraded to secure food safety and improved quality, adopt the European regulations for exported crops, develop the needed legislations and ensure the safety of imported food commodities.

III. Rural development

44. Strengthening rural development in Arab countries is the cornerstone for sustainable socio-economic development in the region. Rural development is directly related to agricultural development and food security. It curtails poverty and contributes to the limitation of migration from rural areas to urban centres, which again leads to major socio-economic problems in both rural and urban areas. Rural development requires the adoption of an integrated approach, with the aim to gradually develop rural societies at the technical, economic, social and environmental levels, taking into consideration the variability of conditions prevailing in rural areas in Arab countries.

A. Current status

45. Rural areas in the region are of diverse nature and include agricultural, pastoral and remote desert areas. Activities in those areas vary according to the nature of resources available. In 2005, 45 per cent of the total population in the Arab region was estimated to be rural dwellers. Migration to urban centres within the same country or to other Arab countries in the search for work is continuing. If such migration trends persist, they will inevitably lead to reduced productivity in rural areas, increase the burden on women and lead children, especially girls, to abandon schools in order to engage in agricultural and other activities, which in turn negatively affects the drop-out rate of basic education students.

46. In addition, most rural areas lack such basic elements of infrastructure and services as modern energy, clean water sources, sanitation facilities and roads, elements which represent the basic needs to achieve the change required towards sustainable development in those areas.

47. It is well understood that rural development is closely tied to the progress that is or can be achieved relevant to the other four issues reviewed in the present report.

B. Progress achieved

48. The Johannesburg Plan of Implementation of 2002 calls for the following:

(a) Provision of infrastructure to rural and remote areas;

(b) Provision of suitable housing;

(c) Support of small-scale agro-industrial projects;

(d) Provision of all needed services;

(e) Empowerment of rural women.

49. The Millennium Development Goals call for the curtailing of poverty and the provision of appropriate health, social and educational services needed for the development of poor areas, which is connected to the development of rural areas. As such, progress is on the basis of the following criteria.

1. Provision of elements of infrastructure

50. About 20 per cent of the total population of the Arab region has no access to electricity and many people in both rural and poor urban areas are severely undersupplied.

51. While accessibility to clean drinking water was slightly improved during the last five years, no such improvement took place in the provision of sanitation facilities. Many rural areas still lack roads and transportation facilities.

2. Progress achieved towards the Millennium Development Goals

Eradication of poverty

52. At the regional level, Arab countries witnessed a slight reduction in poverty during the two periods 1990-1995 and 2000-2004, where the average proportion of population below the poverty line could be reduced from 19.5 to 18.2 per cent, with considerable variations however, among the different countries. In the least developed countries, the average rate of population below the poverty line increased from 37.1 per cent to 46.8 per cent, which indicates the lack of requirements for rural development in those countries.

Basic education

53. The enrolment rate in primary education in 2004-2005 reached 80.5 per cent, with an average increase of 10 per cent over the last 15 years. An enrolment rate of about 90 per cent was reported for the Arab Gulf States, Mashreq and Maghreb countries, while for least developed countries, it averaged 50 per cent.

Empowerment of women

54. Considerable progress was made with respect to the empowerment of women, in particular as regards the access of girls to education, women income-generating activities and female participation in political activities in certain countries.

Improvement of maternal health and reduction of child mortality rates

55. The mortality rate of children under five years of age was reduced from 91 to 70 fatalities per 1,000 live births during 1990-2003. Maternal health services were clearly improved and the maternal mortality rate could be reduced from 465 to 337 women per 100,000 live births. Conditions in the countries of the region vary greatly: in the Arab Gulf States, the maternal mortality rate averages 29.8, compared to an average of 165 women in the Maghreb countries.

Environmental sustainability

56. In addition to the implementation of several programmes and projects in different sectors concerned with environmental sustainability, several Arab countries have integrated the strategies and policies of sustainable development into their

national development policies. However, ESCWA revealed that the region still suffers from major problems related to the management and conservation of natural resources, especially water resources and energy, which have adverse impacts on rural development and lead to further desertification and land degradation.

C. Challenges and constraints

57. Information on challenges and constraints appears in paragraphs 27 to 36 above.

D. Areas for action

58. Ample consideration needs to be given to the implementation of measures recommended to enhance sustainable rural development in the region, including the following:

(a) To devote, at the national and regional levels, efforts to the development of rural areas in all Arab countries, including the realization of the Millennium Development Goals, above all the eradication of poverty and hunger, enhance basic education, improve maternal health, reduce child mortality rates and empower rural women to actively participate in the various efforts;

(b) To integrate rural development needs and programmes into the national strategic development plans of the countries of the region, making sure that rural and urban areas have equitable access to resources;

(c) To strengthen infrastructure in rural areas, especially as regards energy, water and sanitation facilities, and ensure means for equitable access to resources and services;

(d) To pay greater attention to the capacity-building needs of rural women and the means to expand their opportunities for gainful employment, giving special attention to maternal and child health, the eradication of AIDS and other diseases, and the improvement of statistical recording;

(e) To attract national and foreign capital resources for investment in labour-intensive projects that are socio-economically and environmentally sound, especially in the more populated rural areas, as a means to expand employment opportunities for the rural poor and to benefit from available international financial mechanisms, including United Nations Convention to Combat Desertification mechanisms, to enhance investment in rural development;

(f) To strengthen the role of community-based organizations and popular participation in the planning and implementation of sustainable development projects;

(g) To regularly conduct technical country studies so as to monitor progress towards the achievement of different Millennium Development Goals in order to facilitate evaluation, comparative analysis and the initiation of timely action.

IV. Land

A. Current status

1. Land use categories

59. The Arab region represents the largest geopolitical unit of the arid and semi-arid regions of the Earth. It is characterized by the presence of vast desert lands and the scarcity of arable land. Of the total area of the region, 4 per cent is cultivated arable land and 10 per cent is non-cultivated arable land, 4 per cent is forest area and 27 per cent is rangeland, the largest land use category in the region.

60. It is of great significance to stress the vast disparity among the countries of the region as regards types and ratios of land use. The proportion of arable land is remarkably high in Algeria, Iraq, Morocco, the Sudan and the Syrian Arab Republic, and figures for rangeland and natural forest area are similar. The per capita share of cultivated land also shows a wide disparity among the countries of the region and has continuously and significantly declined over the last 25 years. The ratio of irrigated area to cultivated land shows great variations among the countries of the region and ranges from 20 to 95 per cent. Irrigated land is highly productive and hence of great significance.

2. Characteristics of prevailing soil types

61. The main soil types in the region are classified under two soil orders, namely, aridisols and entisols:

(a) *Aridisols*. Soil types classified under the order of aridisols are widespread over most of the Arab region. Those arid soil types are recognized as desert soils that are not capable of producing most crops, including cereals, without irrigation. Among the main groups belonging to aridisols are calcareous, gypsiferous and saline soils. Aridisol soil types are characterized, in general, by low productivity and limited availability of most major and minor nutrients. The presence of gypsiferous soils not only negatively affects the provision of plants with nutrients, but in areas of irrigated agriculture can also cause numerous engineering problems, most importantly frequent breakdowns of irrigation channels. Saline soils limit the overall growth of crops, especially species that are non-tolerant or slightly tolerant of salinity;

(b) *Entisols*. Soils of this order lack the presence of diagnostic horizons within a specific depth in their profiles. Most are alluvial, sandy and shallow soils, while less frequent entisol types include clay and waterlogged soils.

62. The foregoing review of characteristics of the most important soil types in the region clearly shows that those soils undergo varied degradation processes. The fragile and infertile nature of the virgin soils requires the sensible application of appropriate management techniques and the rational use of those soils to achieve sustainable development instead of soil degradation.

63. Water scarcity is regarded as the main limiting factor of agricultural development in this highly arid region. The scarcity of water resources is reflected by the present annual per capita average of water resources, which is estimated at 1,057 m^3 and barely exceeds the critical water scarcity line of 1,000 m^3 per capita

per annum. Even worse, many Arab countries are already projecting the annual per capita average to drop below the scarcity line.

64. Conventional water resources include rainfall, surface water and groundwater. According to AOAD, the amount of water the Arab region received through rainfall is estimated at 2,282 billion m^3/year, compared to an estimated 205 billion m^3/year from surface water and 35 billion m^3/year from groundwater. Those figures indicate that rainfall, which is already widely marginal throughout the region, represents the major water resource. Moreover, that valuable resource is highly susceptible to drought spells, inter-annual and seasonal variations as to intensity and frequency of rainfall and length of the growing season, and can be subject to erratic distribution. Those factors strongly affect the efficiency of rainwater received and significantly influence the surface runoff into streams and wadis and the recharge of groundwater aquifers.

65. Surface water resources mainly originate from large rivers, including the Nile, Euphrates and Tigris, which receive their discharged water from high rainfall areas outside the boundaries of the Arab region. Other rivers of perennial flow stem primarily from the main highlands in the Arab region. They are much smaller and cover shorter distances.

66. In addition to rivers, surface and runoff water seasonally flows through otherwise dry wadis that are widespread in the Arab region.

67. Groundwater resources of varied capacities are widely spread over the region. Several large aquifers with huge groundwater storage are shared by neighbouring Arab countries and a few countries from outside the region. Among those aquifers are the Nubian sandstone aquifer shared by Chad, Egypt, the Libyan Arab Jamahiriya and the Sudan, the Grand Aquifer shared by Algeria and Tunisia, the Eastern Mediterranean aquifer in the east of the Arabian Peninsula, shared by Bahrain, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates, and other aquifers of smaller capacities.

68. Groundwater resources offer large and relatively underexploited resources that require rational regulations, including the adherence to safety extraction factors, rational use of extracted water and potential conjunctive use with other water resources, with ample consideration of sound economic feasibility aspects to secure social benefits and sustainable development.

69. Unconventional water resources, including agricultural drainage water, treated sewage effluents and desalinated water, represent significant additional water resources provided that they are used in a rational manner with a view to securing quality control, safety regulations, proper allocation for appropriate objectives and suitable socio-economic gains.

3. Plant cover

Rangelands

70. Natural rangelands extend over 27 per cent of the total area of the Arab region and are mainly situated in areas of as little as 50 to 200 mm of average annual rainfall. Rangelands represent the main land use category in the region, with vast areas, potential productivity, indigenous population and shared resources among Arab countries.

71. By the middle of the twentieth century, the rapid population growth and, consequently, increasing demand for food and feed commodities led to the introduction of crop cultivation in rangelands. The overexploitation of the fragile natural ecosystem of rangelands, resulting in the loss of natural plant cover, together with the low probability for the cultivated crops to reach maturity (once every three or four years owing to marginal rainfall) are the major dilemmas facing rangeland agriculture.

72. The increased demand for rangeland products led to the overstocking of animals beyond the proper carrying capacity of the land, which, in turn, caused serious overgrazing, loss of plant cover, severe degradation of palatable species and the loss of highly valued biodiversity and adapted species. Improper grazing and range management practices caused serious adverse impacts on the sustainability of plant cover.

73. In all cases, the loss of the natural plant cover of rangelands led to increased erosion through wind and water, causing a reduction of the valuable top soil, which further leads to a loss in the resource base and rapid degradation of soil productivity (on-site). Furthermore, eroded soil materials carried off by water and wind cause such severe adverse environmental impacts in the settling areas (off-site) as the hazardous siltation of water reservoirs and sand encroachment on strategic installations, industrial areas and highways in urban areas, resulting in huge economic losses, both on-site and off-site.

74. The land tenure system based on the communal tribal traditions that prevail in rangelands has adverse impacts on range management practices, sustainable development, the introduction of needed investments and the enhancement of social benefits.

Forest areas

75. Forest areas are located mainly in the elevated lands of the Arab region and their distribution among the Arab countries differs greatly. In the 1970s, forest lands occupied an estimated 6.6 per cent of the total area. They produce diversified goods and offer services and benefits with particular reference to biodiversity, climate and the carbon sequestration process.

76. Deforestation continued to take place over the last few decades in the countries of the region at annual rates ranging from 0.8 to 2.4 per cent. Such high rates of deforestation over extended years caused the decline of total forest land in the Arab region to reach an estimated 4 per cent by the year 2000. Nevertheless, it is encouraging to report that, within the last decade, concerted efforts were made in most countries to halt the rapid decline in forest areas and to rehabilitate significant areas through improved management and afforestation efforts.

B. Progress achieved

77. The Arab region witnessed varied achievements in the fields of soil improvement, conservation and development, including the following:

1. Management practices

78. In irrigated lands, improved management practices were adopted that include the use of appropriate soil amendments, adhering to crop rotation, gradual improvement of irrigation techniques and enhanced adoption of integrated pest management. Such practices were implemented and led to significantly improved soil productivity in several Arab countries.

79. In rain-fed areas, particular attention was given to the development and cultivation of drought-resistant varieties, use of appropriate cereal/legume rotation, development of appropriate species adaptable for mechanical harvesting, use of water harvesting and spreading techniques, adoption of contouring and conservation tillage techniques, with different success, however. Efforts by Arab and regional organizations, were demonstrated to enhance the awareness and significance of such techniques.

80. As regards rangelands, efforts were made to increase rangeland productivity through the adoption and application of appropriate management techniques, which was done with varying success.

81. Integrated forest land management was demonstrated in a few countries.

2. Combating natural disasters

82. Activities were carried out on a limited scale to combat flash floods, locust attacks and major pollution. One particular success story was the establishment of a coordination mechanism by LAS to combat and mitigate the impacts of such events.

3. Development of assessment and follow-up techniques

83. Arab, regional and international organizations as well as national institutions developed and applied techniques to monitor the development of soil properties, plant cover and environmental parameters through the use of remote sensing and geographic information system techniques.

4. Establishment of thematic databases

84. Thematic numerical databases were established to improve decision-making and land management practices through the collaboration of Arab organizations and national institutions (namely, ACSAD, in cooperation with several countries).

5. Formulation of guidelines for the use of wastewater

85. Guidelines for the appropriate reuse of wastewater for agricultural purposes, depicting both potentials and constraints, were prepared by an inter-agency task force which held a series of meetings in Cairo.

C. Challenges and constraints

86. Information on challenges and constraints appears in paragraphs 27 to 36 above.

D. Areas for action

87. The following areas for action are proposed to enhance the progress made towards sustainable land development in the Arab region:

(a) At the national level:

(i) To design and implement national programmes to enhance the survey of land resources, prepare land maps and complement all pertinent information so as to establish credible digital databases that do not contradict other information sources, while supporting proper planning for land resources management, enhancing investment and advancing collaboration with Arab and regional organizations concerned;

(ii) To formulate legislation and laws and take actions to protect land and water resources from such degradation factors prevailing in the region as pollution, urban encroachment, irrational management and overexploitation of resources;

(iii) To develop and conserve land resources through the support of extension services, transfer of appropriate technologies and effective implementation of pertinent legislation;

(iv) To support the facilities of research institutions in Arab countries so that research activities addressing the real problems of beneficiaries at the field level can be carried out. Such an approach would secure the linkage between the results achieved through research and practices at the field level;

(v) To formulate and develop policies and programmes needed to reduce the degradation of water resources in the region through rational water use in all demand sectors, especially agriculture; to follow policies on balanced production and use of water resources based on optimizing returns from unit of water used, proper allocation of water resources based on water quality and suitability of soil properties; and to improve applied irrigation techniques;

(vi) To develop policies in the short, medium and long terms to enhance the use of groundwater resources, adopting safe extraction factors, and the proper use of groundwater at different degrees of salinity, including the conjunctive use of groundwater with other water resources to secure sustainability;

(vii) To encourage the safe use of all water resources available, including unconventional ones, and, by doing so, to alleviate the problems of drought and the scarcity of conventional water resources.

(b) At the regional level:

(i) To encourage cooperation among countries and Arab and regional organizations to formulate an integrated Arab plan to reduce the degradation of land resources, especially in arid and semi-arid areas;

(ii) To exchange expertise and information pertinent to land use among Arab countries as well as between countries and the Arab and regional organizations concerned.

V. Drought

A. Current status

88. More than 90 per cent of the total Arab region is hyperarid or arid. Hyperarid areas, with an average rainfall of less than 100 mm/year, represent 67 per cent of the total area, and dry areas, with average rainfall ranges from 100 to 300 mm/year, make up 23 per cent of the total area. Semi-arid and arid semi-humid regions occupy limited areas in the northern elevated coastal zones of Algeria, Lebanon, Morocco, Tunisia and the Syrian Arab Republic. Seasonal average rainfall, mostly during the autumn and winter seasons, varies from 300 to 1,500 mm/year.

89. Apart from the natural variations of rainfall within a given season and between rainy seasons, many of the Arab countries in northern Africa and western Asia have suffered from recurring drought spells with varied severity and length. Such spells cause a significant reduction of average yearly rainfall by more than 50 per cent. From the end of the 1980s to 1993, Algeria, the Libyan Arab Jamahiriya and Tunisia suffered from several such spells. Over the last few decades, Morocco suffered from drought at the rate of once every three years. The Sudan endured drought spells in the 1970s and 1980s, and Iraq, Jordan, the Syrian Arab Republic and Yemen suffered from similar spells.

90. In addition to the impacts of drought spells, it is anticipated that the region will suffer the adverse impacts of climate change predicted by the Intergovernmental Panel on Climate Change. The projected temperature rise of 1.5-4.5°C will lead to the melting of ice in the two polar regions and, consequently, to a gradual rise in the sea level. Those and other climate changes are expected to put significant pressure on the use of land and water resources. Moreover, the extra heat load would have its negative effects on diseases and the role of micro-organisms and biodiversity, and would increase such severe climatic features as droughts and floods. It is anticipated that those changes will have wide-reaching impacts on the use of natural resources, agricultural productivity and socio-economic conditions in the region and will speed up the desertification process.

B. Progress achieved

91. As drought incidents with varying impacts have recently become more frequent in the Arab region, the awareness of most Arab Governments has increased and some progress in dealing with drought could be achieved. However, efforts still remain below expectations, since measures presently taken are based on crisis management rather than on risk management.

1. Recent adverse impacts of drought

92. When a severe drought occurs, the agricultural sector and its productivity are affected the most. The drought events of the last three decades affected most of the Mashreq and Maghreb subregions, where most Arab countries are located. The 1999 drought caused an estimated loss of 40 per cent of cereal grain production in the Syrian Arab Republic, which led to reduced livestock production. Jordan suffered losses of more than 40 per cent of red meat and milk, and small farmers and herders were most seriously affected. From 1980 to 1985 and from 1990 to 1995, Morocco

experienced drought events that forced the country to import high quantities of cereals, mainly bread wheat, in order to meet the population needs. Droughts occurring from 1999 to 2000 compelled Morocco to import about 5 million tons of wheat in 2001, compared to 2.4 million tons in normal years. Tunisia also suffered droughts in 1982, 1983 and from 1993 to 1995. In Mauritania, two successive dry years, involving crop failure and reduced pastures production, resulted in abnormally high food and feed prices for livestock products.

2. Institutional set-up

93. With the assistance from international organizations, the Arab countries affected by drought have started to focus on drought relief measures. As a response to recent prolonged droughts, most Arab countries have established an intergovernmental drought committee, representing different ministries, to coordinate efforts to deal with drought events. Such activities have resolved some of the constraints and the lack of coordination among different administrations and agencies involved. In several countries, a national drought emergency programme was launched to alleviate drought impacts on population, crops, livestock and agro-pastoral systems. The national coordination committee is usually headed by a senior political authority, in many cases the minister of agriculture or even the prime minister, as is the case in Morocco. Provincial and local committees were also formed to implement drought relief measures adopted by the national coordination committee.

3. Drought relief measures

94. The following relief measures were applied in several countries:

(a) Supplementary feed was provided to safeguard livestock, whereby most of the funds went into subsidies and the distribution of concentrates, especially barley;

(b) Well-digging and the provision of subsidies to irrigation equipment were encouraged;

(c) Debts were forgiven, credits rescheduled and work opportunities in rural areas created.

95. Such provisions are accompanied by other relevant measures, including the monitoring of water resources in dam reservoirs, so that their use can be prioritized and rationalized in case of drought, human and livestock needs (drinking water) can be met and perennial (trees) and field crops can be protected and irrigated. Furthermore, agricultural insurance against drought events needs to be provided and seed production increased to guarantee the needs of farmers during the growing season subsequent to drought years.

4. Long-term measures

96. As a result of the efforts of international organizations to sensitize decision makers, most Arab Governments now recognize the urgent need to develop long-term risk management strategies based on drought preparedness and mitigation. It is recognized that Arab countries have become more involved in regional and international workshops, networks and research programmes which aim at the development of strategies for long-term drought management. Moreover, the actions

described below show that research and academic institutions are combining their efforts at the national and regional levels to help find long-term solutions to drought. Research activities are related to the development of decision-making tools and drought mitigation strategies. Some of those activities are summarized as follows:

(a) An expert consultation and workshop by the Food and Agriculture Organization of the United Nations (FAO), ICARDA and the European Commission on drought mitigation in the Near East and the Mediterranean was organized at ICARDA headquarters in Aleppo, Syrian Arab Republic, in May 2001;

(b) A drought information network was launched by FAO and ICARDA, as main founders, and the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM) and the European Commission, as collaborators;

(c) A project on Mediterranean drought preparedness and mitigation planning (MEDROPLAN) for the Mediterranean region, the Middle East and North Africa (MENA) that aims at the development of tools for drought risk management was conducted by different national agricultural research systems in collaboration with ICARDA and CIHEAM-Zaragoza, Spain, and is now developed into a regional network. The methodology has already been tested in pilot sites in some countries;

(d) For the Maghreb region, a network for the development of an early warning safety monitoring and assurance system for droughts was established between Algeria, Morocco and Tunisia and coordinated by the Sahara and Sahel Observatory. The plan of action was launched and some activities have been initiated;

(e) The latest effort on drought management, which is very relevant to Arab countries, is the development of the network on Drought Management for the Near East, Mediterranean and Central Asia (NEMEDCA Drought Network) coordinated by ICARDA, the FAO Regional Office for the Near East and CIHEAM-Zaragoza. The activities of the network will be based on tools and guidelines developed by the MEDROPLAN project. The main objective of NEMEDCA is to enhance technical cooperation among the organizations and national institutions pertinent to drought and to strengthen the exchange of information and expertise among member countries.

5. Climate change

97. Reports of the Intergovernmental Panel on Climate Change have highlighted the effects of climate change, such as rise in temperature and sea-level rise, in addition to dangerous biological and socio-economic effects.

C. Challenges and constraints

98. Information on challenges and constraints appears in paragraphs 27 to 36 above. In addition, efforts exerted at combating drought have not yet reached the desired levels, especially as the approaches that have so far been adopted are currently focused on disaster management rather than on risk management.

D. Areas for action

99. In order to successfully tackle the challenges brought about by droughts, it is suggested to take the following measures:

(a) To establish and activate early drought warning systems specialized to secure the continuous flow of scientific and climatic data and indicators pertinent to the identification of measures needed to manage and mitigate adverse impacts, with particular emphasis on collaboration among Arab countries;

(b) To introduce support means to predict drought spells through credible field monitoring processes, use of remote sensing techniques and recording of socio-economic indicators. All such indicators would be used as part of integrated techniques to achieve a better understanding of how to predict drought events in the Arab region;

(c) To identify and map zones that are homogenous in terms of climate conditions, soil characteristics, landscape, water resources and types of land use. This knowledge can allow the establishment of drought vulnerability profiles, the drawing of drought risk maps and the choice of appropriate strategies for drought mitigation and management;

(d) To establish and develop ample measures to mitigate and adapt to potential climate change, investigate possible impacts and formulate plans for the protection of the lengthy coastal areas of the region. In view of the findings reported by the Intergovernmental Panel on Climate Change pointing out the latest possible scenarios for sea-level rise and other anticipated adverse impacts, this measure is of high priority;

(e) To call for a greater merger of financial instruments and to secure synergy among efforts to combat the negative effects of land degradation, drought and climate change.

VI. Desertification

A. Current status

100. Desertification is defined by the United Nations Convention to Combat Desertification as land degradation through the loss or reduction of productivity and biodiversity of cultivated lands, rangelands and forest areas owing to human and climatic factors. In the Arab region, the majority of land resources is subject to desertification in various degrees because of different factors leading to serious environmental, economic and social problems facing the population of the region.

101. The adverse impacts of desertification in the region are: degradation and low productivity of most rangelands; degradation of forest areas, land cover and biological diversity; loss of productivity; and deterioration of cultivated land properties, both irrigated and rain-fed. In addition, desertification contributes to the increase in poverty, the deterioration of human livelihood and the migration of men from rural to urban areas, which multiplies the burden on women and children in rural areas.

B. Progress achieved

102. Even though Arab countries and regional organizations acting in the region have carried out major activities to combat desertification since the ratification of the Convention and subsequent treaties pertinent to sustainable development, above all, the Johannesburg Plan of Implementation, desertification still represents a major threat to human livelihood and to the conservation of natural resources in the Arab region. Therefore, efforts need to be maximized to curtail constraints and address challenges facing the Arab countries while combating desertification. The major examples of progress achieved in most Arab countries are listed below:

(a) Many Arab countries ratified the United Nations Convention to Combat Desertification, formulated its National Action Programmes to implement the Convention according to its guidelines and Conference of the Parties resolutions and decisions, and incorporated measures to combat desertification into their national development plans;

(b) Institutions and councils were set up that deal with combating desertification and securing environmental conservation and safety, in cooperation with ministries of environment and in coordination with the activities of the ministries concerned;

(c) Legislation was formulated to secure the implementation of measures and activities to curtail resource degradation, including protection against urban encroachment on productive lands, curtail pollution from varied sources and combat man-induced activities contributing to resource degradation. Most existing mechanisms for the implementation of such legislation are either insufficient or absent;

(d) The participatory approach was initiated and the participation of all stakeholders in the planning, designing and implementation of relevant activities and projects promoted;

(e) A number of Arab countries succeeded in securing a large share of financial requirements needed for projects to curtail desertification at the national level;

(f) Several programmes were implemented for capacity-building and raising of awareness on desertification issues at different levels, addressing decision makers, specialists and all other stakeholders;

(g) A number of integrated projects were implemented at the field level to combat desertification under the conditions of different land use categories with the support of foreign funds and global mechanisms through donor agencies, the Global Environment Facility, the United Nations Environment Programme, the United Nations Development Programme and FAO;

(h) Arab countries sponsored several initiatives to support national efforts targeting the combating of desertification, including the rehabilitation of degraded areas, the improvement of productivity, the expanded use of unconventional water resources and the development of remote-sensing technologies to monitor desertification;

(i) A number of regional and subregional projects were developed to combat desertification in the region in collaboration with funding agencies and regional and

international organizations. Among those projects are: the elaboration of a regional early warning system for desertification by ACSAD in collaboration with the German Agency for Technical Cooperation; a subregional action programme for combating desertification in countries of West Asia; and the management and protection programme for the conservation of the ecosystem by the Organization for the Advancement of Structured Information Standards.

103. It must be pointed out that the level of cooperation and coordination among Arab countries and between Arab countries and concerned organizations is increasing, in particular for research and extension activities.

C. Challenges and constraints

104. Information on challenges and constraints appears in paragraphs 27 to 36 above.

D. Areas for action

105. The following measures need to be taken as part of the effort to slow down and reverse the effects of desertification:

(a) To incorporate strategies and priorities to combat desertification into national sustainable development policies; to adhere to the implementation of the United Nations Convention to Combat Desertification and participate in the implementation of the subregional action programme;

(b) To adopt an integrated approach to combat desertification, including all physical, biological, social and economic aspects;

(c) To support the establishment of information centres specialized in the monitoring and combating of desertification and to train specialists to follow and adopt the integrated techniques for the conservation of natural resources and their sustainable development;

(d) To adopt the participatory approach, including all stakeholders concerned, especially women and youth, in all aspects of combating desertification;

(e) To strengthen cooperation in the fields of environmental protection and resource conservation under the umbrella of LAS and to enhance consultation, coordination and the integration of activities between national institutions and regional organizations in order to implement the requirements of the United Nations Convention to Combat Desertification, the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change.

(f) To encourage regional and international programmes and funds as well as donor agencies to provide support to Arab countries in their endeavour to combat desertification.

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